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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/551,251 | 09/15/2006 | Ananya Mukhopadhyay | 4544-052909 | 1805 |

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| EXAMINER | |
|---|---|
| CHANG, SUNRAY | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2121 | |

| NOTIFICATION DATE | DELIVERY MODE |
|---|---|
| 04/14/2011 | ELECTRONIC |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patents@webblaw.com

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/551,251 | MUKHOPADHYAY, ANANYA | |
| | Examiner | Art Unit | |
| | Sunray R. Chang | 2121 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *08 November 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *13-22 and 24-31* is/are pending in the application.

4a) Of the above claim(s) *1-12 and 23* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *13-22 and 24-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

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# *Examiner's Detailed Office Action*

1. This Office Action is responsive to communications, filed on April 14th, 2010;

2. Claims 13 – 22 and 24 – 31 are presented;

3. Claims 1 – 12 and 23 have been cancelled;

## Response to Arguments

4. The examiner thanks the attorney's efforts in trying to amend the claims to be allowed, however, there are still some features therein not clearly claimed according to the Specification, current claims combined with discussions in prior interview; the examiner respectfully indicates the corresponding features in the response to applicants' arguments as listed below:

Applicants' arguments regarding **Andorfer** patent's teaching of various data curves are not based on data collected from different segments of the rolled product but rather from the rolled product as a whole" which is disagreed; **Andorfer** clearly indicated therein "to provide a process with which the material properties of the end product which are to be expected can be **calculated in advance at each step** of the hot rolling production process" (see col. 3, lines 25 – 29).

**Barker** reference substantially teaches different steps, loops with different set points and variables of the machines and rolling mills cooling in serial (fig. 1), **Andorfer** teaches on-line processing the speed, temperature, cooling, etc., and further showing as "curves" (display) to display the material properties of the end product which are to be expected can be **calculated in advance at each step** of the hot rolling production process; **Gramckow** reference (US #6866729

fig. 1, col. 2, lines 12 – 36) clearly teaches a hot strip rolling includes the "segmented" rolling apparatus each equipped with numbers of header jets which is proportional to flow rate and generating specified time-based cooling curves.

5. The segmentation as claimed to segment strip in the direction of rolling (a total length of a strip being rolled), but if it's segmented as described, the measurement would not be considered continuously during the process, but segmented to each section, and collecting the corresponding data after processing the section, which is not as argued in the remarks. In this interpretation, the data collected seems to be collected for simulation to generate another set of commands to control the process for processing next segment.

Applicants are encouraged to call the examiner to provide more information for speedup examination process.

## Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in Graham **v.** John Deere Co., 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. **Claims 13 – 22 and 24 – 31 is/are rejected** under 35 U.S.C. 103(a) as being unpatentable over George W. Barker et al. (U.S. Patent No. 5,289,867, and referred to as **Barker** hereinafter), in view of Josef Andorfer et al. (U.S. Patent No. 6,430,641, and referred to as **Andorfer** hereinafter), and further in view of Robert W. Carnes et al. (U.S. Patent No. 5,770,832, and referred to as **Carnes** hereinafter) and official notice Gramckow et al. (US Patent No. 6,866,729, hereinafter **Gramckow**).

**Regarding claims 13** and **31**,

**Barker** teaches,

- A system for display of property prediction for hot rolled coils in a hot strip mill; [variables in the rolling stage are monitored and displayed by the supervisory computer … one or more of these variables can affect the physical properties of the rod during rolling. The supervisory computer can produce a change in value of these variables if the desired physical properties of the rod are not achieved as indicated by the information generated by the historical data generating means, col. 8, lines 19 – 30]
- a unit for providing data on rolling schedule with chemistry from the steel making stage; [236, product input, fig. 2; col. 6, line 44 – col. 7, line 13]
- one or more field devices for measuring process parameters during hot rolling; [flowmeter, 239, fig. 2]
- a programmable logic controller for acquiring data of measured parameters from said field devices and transmitting said data parameters to a processor; [monitored by programmable logic controller ..., col. 14, lines 34 - 66; fig. 2]

- means for converting the measured data from time domain to space domain using segment tracking, wherein a total length of a strip being rolled is divided into a plurality of segments; [values corresponding to a particular physical property, e.g., tensile strength, and values corresponding to actual flow rates monitored by the programmable logic controller 37 **during the run** are then processed by the supervisory computer 35 to determine whether the actual physical property of the rod is within the preset tolerance for the physical property which was input into the supervisory computer 35 at the initiation of the process. If the rod is out of tolerance, the supervisory computer 35, in cooperation with an historical data generating means 42, will calculate a new set point for the programmable logic controller 37 that is expected to bring the physical property into tolerance, col. 14, lines 34 – 66; 20, 22, 24, 26, 28 in fig. 1; col. 3, lines rolling mill cooling, fluid flow loop, programmable logic controller monitors actual flow rate by each flowmeter (see col. 3, lines 32 – 47)]
- a computation module for processing data for predicting mechanical properties of the strip being rolled; [used to predict or obtain the desired cast bar characteristics required to produce the desired rod properties, col. 13, line 62 – col. 14, line 4]
- said predicted data on mechanical properties outputted from said computation module is stored in another unit for use by said scheduling unit at production planning and scheduling level. [may be saved or adjusted by the supervisory computer for future use based on this historical data, col. 4, lines 9 - 14]

**Andorfer** has been cited to provide a process with which the material properties of the end product which are to be expected can be calculated in advance at each step of the hot rolling production process; **Andorfer** reference teaches,

- A system for on-line display of property prediction for hot rolled coils in a hot strip mill; [process to monitor and control the quality of rolled products from hot-rolled processes which produce products such as sheets, rods, from input stock such as slabs, billets. The process estimates in advance the expected material properties of the end product at each step of the hot-rolling production process, Abstract]
- a unit for providing data on rolling schedule with chemistry from the steel making stage; [precalculated material properties, col. 3, lines 41 – 48]
- one or more field devices for measuring process parameters during hot rolling; [detected on-line … On-line detection of the actual and instantaneous production conditions, col. 3, lines 30 – 41]
- means for converting and displaying the measured data from time domain to space domain, process history data are tracked and collected in each of the plurality of segments as the strip moves through the strip mill and the process history data are stored as a segmental file; [time-temperature curve, cooling curve, heating curve, rolling curve, calculating on-line, col. 3, line 49 – col. 4, line 45; rolling mill stands (see col. 6, lines 44 – 57)]
- a computation module for processing data for predicting mechanical properties of the strip being rolled; [samples, col. 4, lines 52 – 64] and
- a display unit for displaying predicted values for each segment, [time-temperature curve, cooling curve, heating curve, rolling curve;, col. 3, line 49 – col. 4, line 45] the values being one or more of a cooling temperature, ferrite grain size, yield strength, ultimate tensile strength, percentage elongation and nitrogen in solid solution/precipitate, so preventive and

corrective action can be taken during rolling. [col. 3, lines 30 – 41 and col. 3, line 49 – col. 4, line 45]

**Carnes** teaches predicting mechanical properties along the length and through the thickness of the strip [product of the measured width and the nominal pipe wall thickness, col. 8, lines 33 – 38], for the purpose of determining and controlling the cooling rate for metal alloys [col. 1, lines 17 – 18].

The examiner further cites reference (used in one of the forth rejections), Gramckow et al. (US #6866729 fig. 1) clearly shows the hot strip rolling mill which has been again cited herein as an official notice for teaching the "segmented" rolling apparatus each equipped with numbers of header jets which is proportional to flow rate and generating specified time-based cooling curves.

It would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of **Barker** and **Andorfer** to include "predicting mechanical properties along the length and through the thickness of the strip", for the purpose of determining and controlling the cooling rate for metal alloys [col. 1, lines 17 – 18].

**Regarding claim(s) 14**,

**Barker** teaches, the system as claimed in claim 13, wherein

- said field devices include one or more of a pyrometer, a speedometer, a thickness gauge, and a solenoid valve for measuring data on process parameters. [radiation temperature sensors, col. 14, lines 34 – 38]

**Regarding claim(s) 15 – 17 and 25**,

**Barker** teaches, the system as claimed, wherein,

- said programmable logic controller is a Westinghouse PLC 26 connected to said field devices through coaxial cable using remote I/O. [programmable logic controller, 237, fig. 2]
- said programmable logic controller is configured to capture data from said field devices over 0.01 sec. using WESTNET I data highway with Daisy Chain Network topology. [programmable logic controller, 237, fig. 2]
- said processor is an ALSTOM VXI 186 processor and the data transfer between said processor and said programmable logic controller is through WESTNET II using coaxial cable with Token Pass Network topology. [supervisory computer , 235, fig. 2]

Since there is no indication regarding the purpose for using these specific PLC/Daisy chain/Token Pass/ALSTOM VXI/WESTNET I (II), they can be treated as a regular PLC/network/computer; further, this PLC/processor/network is a well known in the art product, not applicants' own invention.

**Regarding claim(s) 18** and **26**,

**Carnes** teaches the system with said computation module includes a deformation sub-module for determining final austenite grain size after finish rolling. [deformation, austenite grain size, col. 6, lines 51 – 65], for the purpose of determining and controlling the cooling rate for metal alloys [col. 1, lines 17 – 18].

**Regarding claim(s) 19**,

**Barker** teaches, the system as claimed in claim 13, wherein

said computation module includes a thermal sub-module for determining the temperature drop during radiation while cooling said hot rolled strip. [to cool the cast bar, col. 4, lines 15 – 21]

**Regarding claim(s) 20**,

**Carnes** teaches the system wherein said computation module includes a microstructural sub-module for determining microstructural changes during phase transformation. [microstructural, col. 9, lines 5 – 33; microstructure has been changed, col. 28 – 40], for the purpose of determining and controlling the cooling rate for metal alloys [col. 1, lines 17 – 18], for the purpose of determining and controlling the cooling rate for metal alloys [col. 1, lines 17 – 18].

**Regarding claim(s) 21**,

**Carnes** teaches the system as claimed in claim 13, wherein

- said computation module includes a precipitation sub-module for determining an amount of aluminum nitrogen in a solid solution and in precipitates after cooling. [microalloying, col. 6, lines 9 – 18], for the purpose of determining and controlling the cooling rate for metal alloys [col. 1, lines 17 – 18].

**Regarding claim(s) 22**,

**Carnes** teaches the system as claimed in claim 13, wherein

- said computation module includes a structural property correlation sub-module for calculating a yield strength [col. 5, lines 9 – 11], ultimate tensile strength [col. 8, lines 25 – 55] and percentage elongation [col. 8, lines 47 – 55] based on the phases present, for the purpose of determining and controlling the cooling rate for metal alloys [col. 1, lines 17 – 18].

**Regarding claim(s) 27 and 28**,

**Barker** teaches, the system wherein

- the system includes a display unit for displaying one or more of a cooling

**Regarding claim(s) 24, 29 and 30**,

**Barker** teaches, the system wherein

- the system includes a data warehousing device for storing the data generated by said computation module. [col. 4, lines 9 – 12]

## Correspondence Information

7. Any inquires concerning this communication or earlier communications from the examiner should be directed to Sunray Chang, who may be reached Monday through Friday, between 6:00 a.m. and 3:00 p.m. EST. or via telephone at (571) 272-3682 or facsimile transmission (571) 273-3682 or email sunray.chang@uspto.gov.

If you need to send an Official facsimile transmission, please send it to (571) 273-8300.

If attempts to reach the examiner are unsuccessful in the regular office hour, the Examiner's Supervisor, Albert Decady, may be reached at (571) 272-3819.

**Sunray Chang**
Art Unit 2121

/ALBERT DECADY/
Supervisory Patent Examiner, Art Unit 2121

April 11, 2011
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